

Attorney Docket No. 110348-133033  
Intel P16696

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

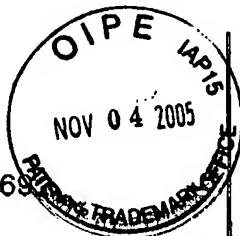
In Application of:

**House et al.**

Application No.: 10/763,469

Filed: January 22, 2004

For: PIVOTABLE SLURRY ARM



Examiner: Hadi Shakeri

Art Unit: 3723

Confirmation No.: 6667

**CERTIFICATE OF TRANSMISSION/MAILING**

I hereby certify that this correspondence is being facsimile transmitted to the USPTO or deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to: Commissioner for Patents, PO Box 1450, Alexandria, VA 22313-1450 on this date: 11/02/2005

Typed or Printed: Herbert L. Adamson

Signature: Herbert L. Adamson

Date: 11/02/2005

Commissioner for Patents  
PO Box 1450  
Alexandria, VA 22313-1450

**Declaration of Inventors Pursuant to 37 C.F.R. § 1.131**

Sir:

We, Colby J. House and Heng Liu, hereby declare that:

1. We are citizens of the United States of America, and currently are residents of the State of Oregon, residing in or around the greater Portland metropolitan area.
2. We are co-inventors of the subject matter of the above-captioned application, as originally declared on or around October 27, 2003, in the combined declaration and power of attorney, filed on or around January 22, 2004.
3. We are both employed by Intel Corporation of Santa Clara, California, the assignee. Intel Corporation is an internationally recognized company that files well over a thousand patent applications annually.

Attorney Reference No. 109263-129130  
Inte P14927

Patent

4. To the best of our recollection and as refreshed by attached Exhibits I and II, the subject invention was conceived on or prior to September 20, 2002. Exhibit I is a photocopy of an Inventor Disclosure Form, and Exhibit II shows the creation date of the Inventor Disclosure Form of September 20, 2002. The Inventor Disclosure Form was filed with Intel Corporation's legal department on February 11, 2003, as shown in Exhibit III.

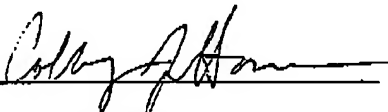
5. We additionally declare that we worked diligently with our colleagues in the legal department and our outside patent counsel from at least prior to February 20, 2003, until the filing date of the application on January 22, 2004, to constructively reduce our invention to practice with the filing of the above-captioned application. This diligence is supported by the Inventor Disclosure Form (Exhibits I and II), Exhibit III showing, among other things, that the Invention Disclosure Form was received by Intel Corporation's legal department on or about February 11, 2003, duly reviewed and selected for filing by the Thermomechanical Patent Committee (which reviews hundreds of invention disclosures per quarter), and a new client/matter form (Exhibit IV) from the law firm of our patent counsel, Schwabe, Williamson & Wyatt. Our employer, Intel Corporation (assignee of the application), duly retained the services of the law firm of Schwabe, Williamson & Wyatt, which in turn duly assigned one of their patent counsels on or before April 23, 2003, to draft the subject patent application, which eventually led to the filing on January 22, 2004, after at least two draft iterations which we reviewed and a standard quality review by the Intel Corporation's legal department. Exhibit V is a billing statement from Schwabe, Williamson & Wyatt showing the time spent by their patent counsels throughout 2003 and January 2004 to prepare the subject patent application for filing.

Attorney Reference No. 109263-129130  
Inte P14927

Patent

**We further declare that all statements made herein of our own individual knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the above-identified patent application or any patent issued thereon.**

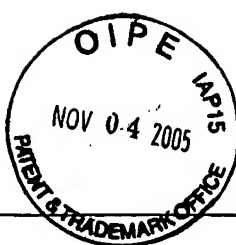
Executed by and on the date(s) as set forth below:

By:   
Colby J. House

Date: 10/9/05

By:   
Herng Liu

Date: 10/10/05



# INTEL INVENTION DISCLOSURE

## ATTORNEY-CLIENT PRIVILEGED COMMUNICATION

located at <http://legal.intel.com/patent/index.htm>

DATE: \_\_\_\_\_

It is important to provide accurate and detailed information on this form. The information will be used to evaluate your invention for possible filing as a patent application. **Invention Disclosure forms MUST be sent electronically via email to your manager/supervisor who should then forward with their approval to our email account "invention disclosure submission."** If you have any questions, please call 8-264-0444.

Last Name: House		First Name: Colby		M.I. J	
Intel Phone Number: 503-613-8310		Intel Fax Number:		Mailstop: RA1-236	
E-mail address: Colby.j.house@intel.com				WWID: 10638266	
Citizenship: U.S.		Are you a contractor?		Yes:	No: X
Home Address: 2532 NW 4 <sup>th</sup> Avenue					
City: Hillsboro		State: OR	Zip: 97124	Country: USA	
Corporate Level Group:		Division:		Subdivision:	
Supervisor: Bramblett, Thomas		WWID: 10072287	M/S: RA1-234	Phone #: 503-613-2598	

Last Name:		First Name:		M.I.	
Intel Phone Number:		Intel Fax Number:		Mailstop:	
E-mail address:				WWID:	
Citizenship:		Are you a contractor?		Yes:	No:
Home Address:					
City:		State:	Zip:	Country:	
Corporate Level Group:		Division:		Subdivision:	
Supervisor:		WWID:	M/S:	Phone #:	

Last Name:		First Name:		M.I.	
Intel Phone Number:		Intel Fax Number:		Mailstop:	
E-mail address:				WWID:	
Citizenship:		Are you a contractor?		Yes:	No:
Home Address:					
City:		State:	Zip:	Country:	
Corporate Level Group:		Division:		Subdivision:	
Supervisor:		WWID:	M/S:	Phone #:	

### (PROVIDE SAME INFORMATION AS ABOVE FOR EACH ADDITIONAL INVENTOR)

#### 2. Title of Invention:

Motorized slurry arm with or without precision dispense nozzle.

#### 3. What technology/product/process (code name) does your invention relate to (be specific if you can)

All technologies using CMP.

#### 4. Include several key words to describe the technology area of the invention in addition to # 3 above:

Slurry dispense, CMP, Thin Films, Motorized, process control

#### 5. Stage of development (i.e. % complete, simulations done, test chips if any, etc.):

Concept

#### 6a. Has a description of your invention been (or planned to be) published outside of Intel:

No.

If YES, was the manuscript submitted for pre-publication approval through the Author Incentive Program:

If YES, please identify the publication and the date published:

6b. Has your invention been used/sold or planned to be used/sold by Intel or others?

Plans pending for possible trial (usage) on site here at Ronler Acres (Intel).

If YES, date it was sold or will be sold:

No.

6c. Does this invention relate to technology that is or will be covered by a SIG (special interest group)/standard or specification?

If YES, name of SIG/standard/specification: N/A

6d. If the invention is embodied in a semiconductor device, actual or anticipated date of tapeout?

N/A

6e. If the invention is software, actual or anticipated date of any beta tests outside Intel:

N/A

7. Was the invention conceived or constructed in collaboration with anyone other than an Intel blue badge employee or in performance of a project involving entities other than Intel (e.g. government, other companies, universities or consortia)? NO: No. If YES, name of individual or entity:

NO

8. Is this invention related to any other invention disclosure that you have recently submitted? If so, please give the title and inventors:

No.

\*\*\*\*\*  
**PLEASE READ AND FOLLOW THE DIRECTIONS ON  
HOW TO WRITE A DESCRIPTION OF YOUR INVENTION**

**Try to limit your description to 2-3 pages  
Do NOT attach a presentation, white paper, or specification  
ANSWER ALL OF THE QUESTIONS BELOW**

**Please provide a description of the invention and include the following information:**

1. Describe in detail what the components of the invention are and how the invention works.

The motorized slurry arm is composed of three main components: 1. Motor for modulating slurry arm position. 2. Slurry arm for containment of slurry tubing. 3. Slurry tubing that transports slurry from source.

A stepper motor is attached to the slurry arm so that the arm can be swept precisely in real time. In real time, slurry is distributed in a controlled fashion to the head (i.e. how long slurry is applied, what radius of wafer slurry is distributed to).

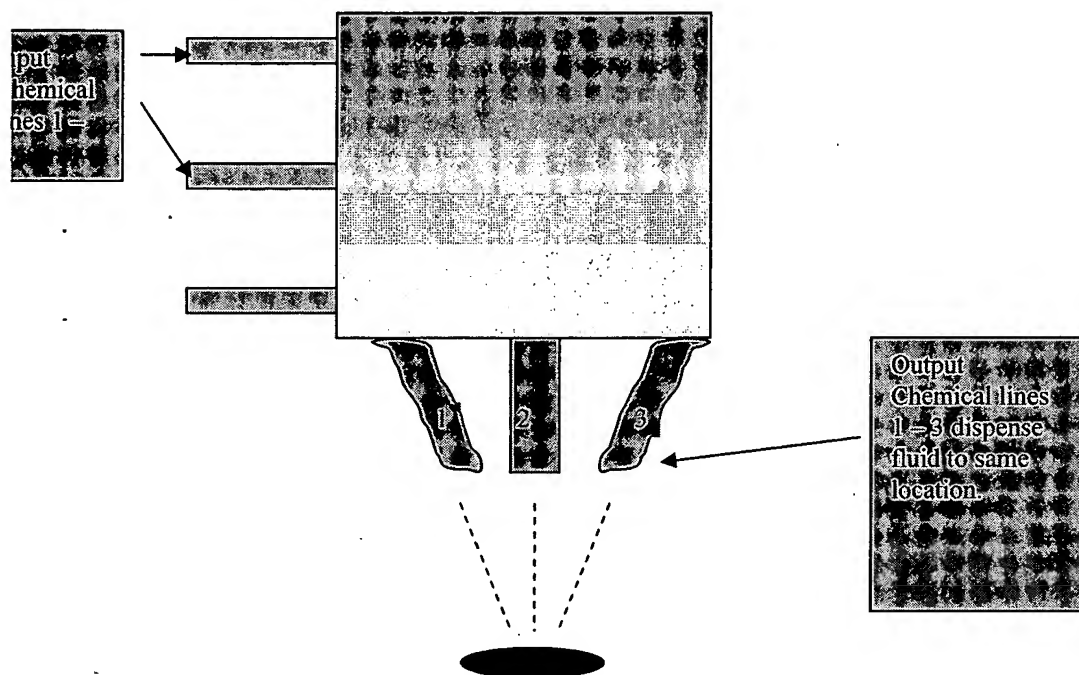
The slurry arm can be retrofit onto a current CMP toolset or included in initial tool design. The new slurry arm configuration would also allow distribution of single and/or multiple chemicals to be distributed onto the same point on the polish surface by angling the output lines. The dispense arm is intended for multiple chemical line inputs and precise dispersion onto polish surface.

2. Describe advantage(s) of your invention over what is currently being done.

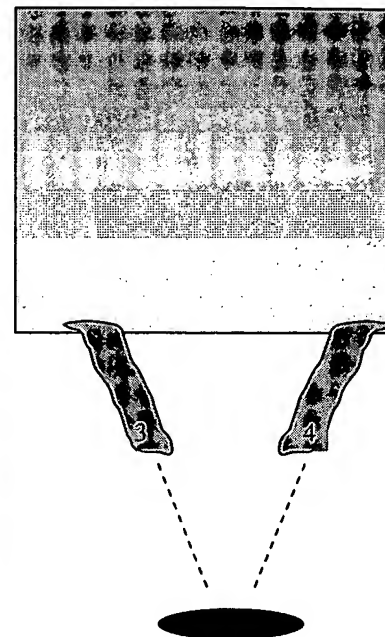
Currently slurry/chemical distribution is provided by a slurry arm that is "fixed" (cannot be controlled in real time). Control of slurry distribution during process would enhance performance and provide more degrees of freedom.

3. You MUST include at least one figure illustrating the invention. If the invention relates to software, include a flowchart or pseudo-code representation of the algorithm.

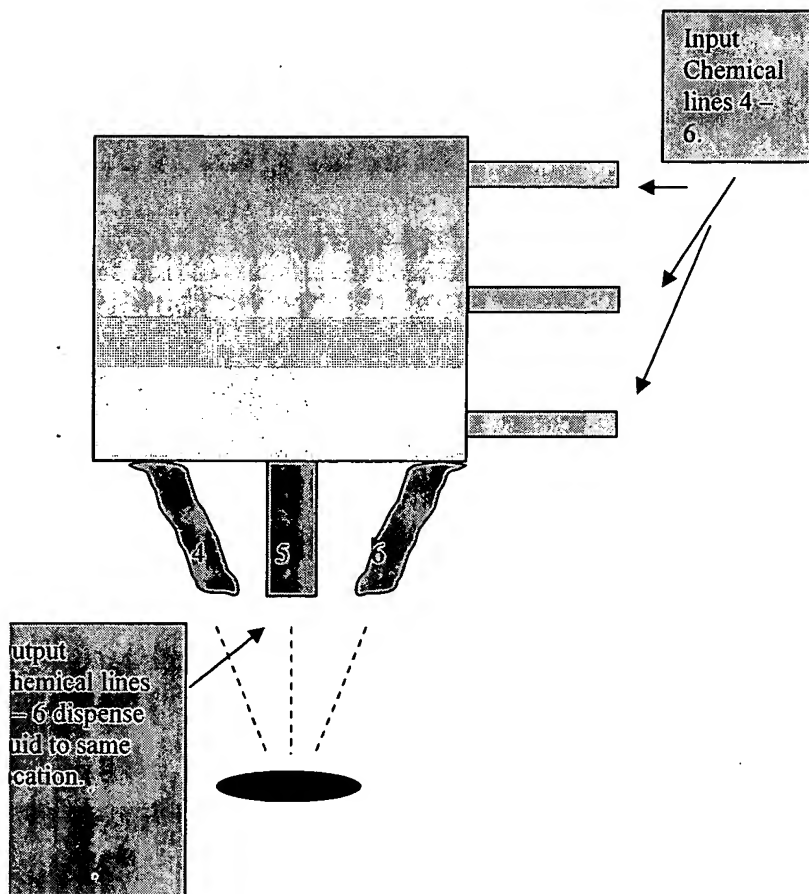
Side View



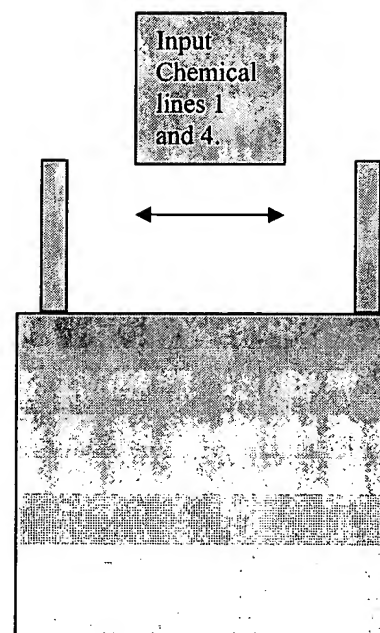
Front View



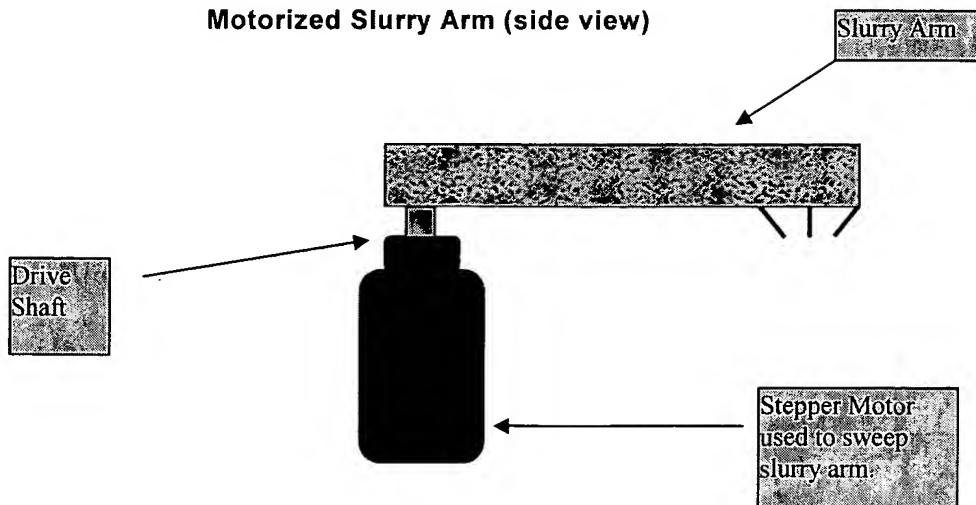
Side View 2



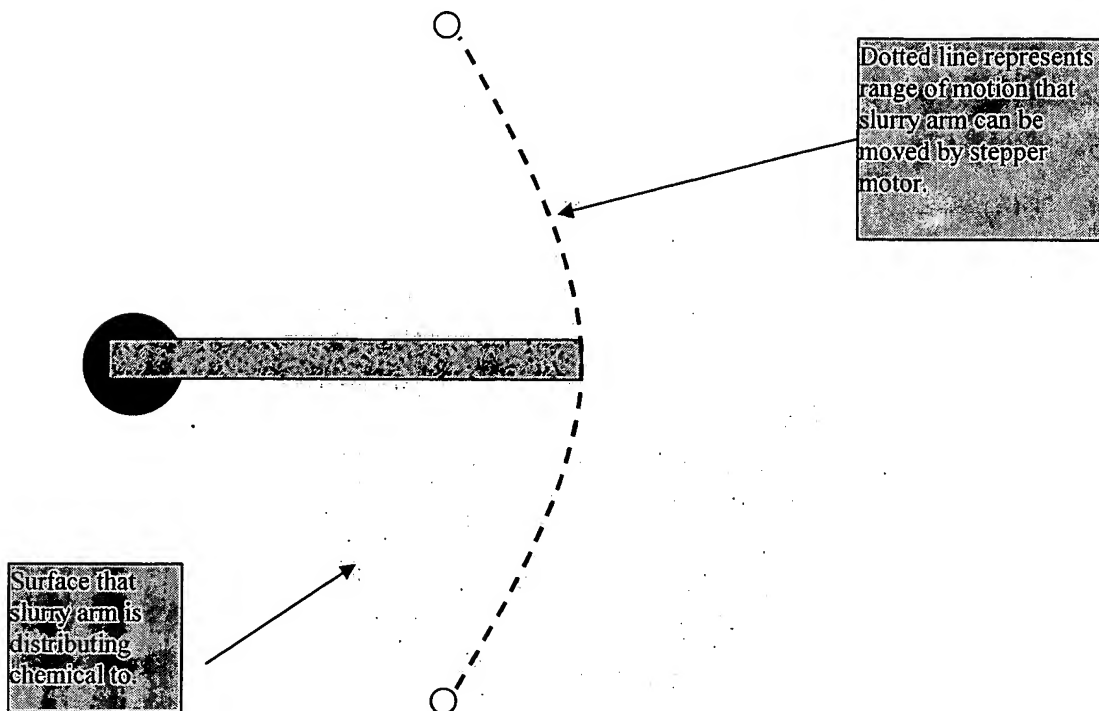
Top View



Motorized Slurry Arm (side view)



**Motorized Slurry Arm (top view)**



4. **Value of your invention to Intel (how will it be used?).**  
This invention could be used in any CMP process and any semiconductor wafer manufacturing.
5. **Explain how your invention is novel. If the technology itself is not new, explain what makes it different.**  
Ability to modulate slurry arm position while in process as a process parameter input variable.
6. **Identify the closest or most pertinent prior art that you are aware of.**  
None.
7. **Who is likely to want to use this invention or infringe the patent if one is obtained and how would infringement be detected?**

**HAVE YOUR SUPERVISOR READ AND FORWARD IT ELECTRONICALLY  
VIA E-MAIL TO "INVENTION DISCLOSURE SUBMISSION"**

DATE: \_\_\_\_\_ SUPERVISOR: \_\_\_\_\_

BY APPROVING, I (SUPERVISOR) ACKNOWLEDGE THAT I HAVE READ AND UNDERSTAND THIS  
DISCLOSURE, AND RECOMMEND THAT THE HONORARIUM BE PAID



Patent Disclosure Form - Slurry Arm (2) - Microsoft Word

File Edit View Insert Format Tools Table Window WorkSite Help InterAction Forms Assistant Type a question for help

Patent Disclosure Form - Slurry Arm (2) Properties

General Summary Statistics Contents Custom

Created: Friday, September 20, 2002 4:46:00 AM  
 Modified: Monday, October 03, 2005 12:34:23 PM  
 Accessed: Monday, October 03, 2005 12:56:34 PM  
 Printed: Friday, September 20, 2002 4:46:00 AM

Last saved by: Colby House  
 Revision number: 10  
 Total editing time: 75 Minutes

Statistics:

Statistic name	Value
Pages:	5
Paragraphs:	135
Lines:	304
Words:	944
Characters:	5211
Characters (with spaces):	6134
Bytes:	22016

OK Cancel

Rev. 16, 502

**INTEL INVENTION**  
**ATTORNEY-CLIENT PRIVILEGE**  
 located at <http://legal.intel.com>

DATE: \_\_\_\_\_

It is important to provide accurate and detailed information about your invention for possible filing as a patent application. Invention disclosure should be made electronically via email to your manager/supervisor who will email account "invention disclosure submission." If you have any questions, please contact your manager/supervisor.

Last Name: House	First Name:
Intel Phone Number: 603-813-8310	Intel Fax Number:
E-mail address: Colby.House@intel.com	
Citizenship: U.S.	Are you a contractor?
Home Address: 2532 NW 4 <sup>th</sup> Avenue	
City: Hillsboro	State: OR
Corporate Level Group:	Division:
Supervisor: E. Thomas	WWID: 1007

Page 1 Sec 1 1/5 At 0.4" Ln 1 Col 1 REC TRK EXT OVR

start 4 M 2 C De... 3 M 2 W 2 L 1:14 PM

Namiki, James J.

From: House, Colby J [colby.j.house@intel.com]  
Sent: Monday, October 03, 2005 1:37 PM  
To: Namiki, James J.; Liu, Heng  
Subject: RE: Patent Application for Slurry Arm Invention

James,

See below for date of disclosure date received (Feb 11, 2003):

Legal Web Site - Patent Database Information Center - Microsoft Internet Explorer

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Address [http://legal.intel.com/patent/Queries/zxdsc\\_list.asp?wwid=10638266](http://legal.intel.com/patent/Queries/zxdsc_list.asp?wwid=10638266)

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Advanc

LGA Quick Links What's New Education Legal Hotline Circuit LGA Search:

### Disclosure Status

Disclosure Status for COLBY HOUSE ( 10638266 )

Committee	Disclosure Number	Disclosure Title	Date Received	Status
TMG/PROCESS	45919	DRYER BOX	6/19/2005	TO BE PUBLIS
TMG/PROCESS	45324	METHOD OF CLEANING WAFERS FOR THE MANUFACTURE OF SEMICONDUCTOR DEVICES	5/2/2005	TRADE SECRE
TMG/PROCESS	33792	METHOD OF INCREASED RUN RATE AND THROUGHPUT UTILIZING MULTISURFACE POLISH PAD DURING CHEMICAL MECHANICAL POLISH	9/4/2003	DECLIN
TMG/PROCESS	31010	POLISH PAD WITH CENTERING WINDOW	4/13/2003	DECLIN
TMG/PROCESS	30757	SOFTWARE PROGRAMMABLE SLURRY DISPENSE ARM FOR OPTIMIZING CMP PROCESS	3/30/2003	PUBLIS
TMG/PROCESS	30110	PROGRAMMABLE MOTORIZED SLURRY ARM WITH OR WITHOUT PRECISION DISPENSE NOZZLE	2/11/2003	PENDIN

**SCHWABE  
WILLIAMSON  
& WYATT**

P.C.  
ATTORNEYS AT LAW

**NEW CLIENT/MATTER FORM**

Date 04/23/2003 Prepared by

EXISTING CLIENT



**CLIENT INFORMATION**

Client Model	110348	Client #	110348
Client Name 1	INTEL LEGAL - PPG/TMG-PROCESS		
Client Name 2			
Address Line 1	INTEL CORPORATION		
Address Line 2	DAVID SIMON		
Address Line 3	CHIEF PATENT COUNSEL		
Address Line 4	C/O MALOU DE LEON, SC4-203		
Address Line 5	2200 MISSION COLLEGE BLVD		
Address Line 6	SANTA CLARA, CA 95052		
City	SANTA CLARA	State	CA
Zip	95052	Country	
Intern'l Prefix		Phone #	(408) 765-6886
Fax #		SS/Tax ID.	
Contact Name		Contact Title	
Dom/Int'l	D	Add To Timekeeper's Contact List	Y

**MATTER INFORMATION**

Matter Model	110348-132026	Matter #	WFM 113198
Matter Description	P16696 - PROGRAMMABLE MOTORIZED SLURRY ARM WITH		
Additional Desc.	OR WITHOUT PRECISION DISPENSE NOZZLE		
Additional Desc.			
Department	BUSN	Business & Corporate	
Practice	110 PT	Patents and Trademarks	
Primary Billing Atty.	TFH	Timothy F Haslach	
Location	01	Portland	
Supervising Atty.	JKL	Klindtworth, Jason K	
Court/Case #		Date of Service	
Claim #		Date of Injury/Date of Loss	
Opposing Counsel			
Dom/Int'l	D		

**MATTER INFORMATION (continued)****Matter Address for billing purposes (if different from the client address)**

Do not put Contact Name into "Address Line1" field.

Address Line 1		
Address Line 2		
Address Line 3		
Address Line 4		
Address Line 5		
Address Line 6		
Intern'l Prefix	Phone #	Fax #
Matter Contact		Matter Contact Title

**RELATED PARTIES**

First Name				Addl. Description		
	INTEL CORPORATION		C	CLI	BUS	

BatchID 30925 04/24/2003 13:30

Conflicts Search Action: #1 Brothers, Randi 04/24/2003

Possible Conflict ☒

Conflicts Search Action: #2 Cliff, Michelle M. 04/24/2003

Approved ☐Reason (explain  
how conflict was  
cleared)

File Folder Request

Conflict Reviewed By:

Practice Group Conflict Review:

AuYeung, Al

04/24/2003

**BUSINESS REVIEW INFORMATION**

Add Client To New Contact List	Desc. of Client Business	
Referred by		
Address		
City/State/Zip		Phone #
Add Referral Source to Contact List		
Anticipated Fees/Costs		Client's Obligation
Retainer	Regular Billing	M Monthly
Fee Arrangement H	Hourly	
Contingency Fee Board Approval		
Contingency Fee Accounting Approval		
Fee Agreement/Engagement Letter		
If no, please explain		
Mandatory Credit Check Exception Request (State Reason)		
Check If You DO NOT Want Automatic Managing Partner's Welcome Letter Sent <input type="checkbox"/>		

**BILLING INFORMATION**

Use Billing Format #	
Other Reference (please specify)	

**Special Billing Rates (other than normal computer rates)** ☐ All Matters for this Client  
☒ This Matter Only

Timekeeper	St. Rate	Rate	Title	Rate

Please continue to the next page to Records Information section.

Special Rate Approval

## APPROVAL & FINALIZATION

Practice Group Approval Cliff, Michelle M. Date 04/24/2003

Record Center Signature Cliff, Michelle M. Date 04/24/2003

The program will use the Autonumbering system method to assign new Client Number. If you wish to change this, please enter the Client Number into the appropriate field. Please also enter the Matter Number and press the "Save Data" button.

Client Number: 110348  
Matter Number: 133033

Assign Client Number: 110348  
Assign Matter Number: 110348-133033

04/24/2003 15:18

## RECORDS INFORMATION

Number  
of folders 1

Folders	bar code
1	
2	

Inserts	folder
1	21
2	22
3	23
4	24
5	25
6	26
7	27
8	28
9	29
10	30
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12	32
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14	34
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16	36
17	37
18	38
19	39
20	40

04/24/03  
BATCH:

30925

NAME SEARCHED: INTEL CORPORATION

Page 1

-----  
SEARCH PATTERN: SSSS

NO HITS FOUND

Batch Number: 30925

Date	Initials	Name/ Invoice Number	Hours	Amount	Description	Matter Number	Index
05/27/2003	PJF	Paul J Fordenbacher	6.75	1,350.00	Review invention disclosure, drafting patent	110348-133033	4131741
02/06/2004		Invoice=874739	0.00	0.00	application		
05/28/2003	PJF	Paul J Fordenbacher	4.25	850.00	Continue drafting patent application	110348-133033	4131743
02/06/2004		Invoice=874739	0.00	0.00			
05/29/2003	PJF	Paul J Fordenbacher	8.33	1,666.00	Continue drafting patent application	110348-133033	4131744
02/06/2004		Invoice=874739	8.33	1,666.00			
05/30/2003	PJF	Paul J Fordenbacher	9.25	1,850.00	Continue drafting patent application	110348-133033	4131745
02/06/2004		Invoice=874739	9.25	1,850.00			
06/17/2003	PJF	Paul J Fordenbacher	3.25	650.00	Drafting patent application	110348-133033	4150224
02/06/2004		Invoice=874739	3.25	650.00			
06/25/2003	PJF	Paul J Fordenbacher	2.00	400.00	Application preparation, submit first draft for	110348-133033	4156553
02/06/2004		Invoice=874739	2.00	400.00	review		
09/11/2003	ATA	Aloysius T (AI) AuYeung	3.50	1,242.50	Reviewed and revised patent application	110348-133033	4223304
02/06/2004		Invoice=874739	3.50	1,242.50			
09/16/2003	ATAW	Aloysius T (AI) AuYeung	1.25	443.75	Revised patent application	110348-133033	4227122
02/06/2004		Invoice=874739	1.25	443.75			
09/17/2003	ATA	Aloysius T (AI) AuYeung	1.00	355.00	Revised patent application	110348-133033	4227080
02/06/2004		Invoice=874739	1.00	355.00			
09/18/2003	ATA	Aloysius T (AI) AuYeung	0.50	177.50	Revised patent application	110348-133033	4227093
02/06/2004		Invoice=874739	0.50	177.50			
09/18/2003	RLS	Rachel L Bradfute	0.60	60.00	Prepare formal documents for inventor signature	110348-133033	4229860
02/06/2004		Invoice=874739	0.60	60.00			
10/28/2003	CJL	Christopher J Lewis	0.20	35.00	Followup with QR on status of application;	110348-133033	4261317
02/06/2004		Invoice=874739	0.20	35.00			
01/13/2004	ATA	Aloysius T (AI) AuYeung	0.50	177.50	Verified formal drawings	110348-133033	4322519
02/06/2004		Invoice=874739	0.50	177.50			
01/22/2004	ATA	Aloysius T (AI) AuYeung	0.50	187.50	Services in connection with filing	110348-133033	4328125
02/06/2004		Invoice=874739	0.50	187.50	non-provisional patent application		
01/22/2004	HLA	Heather L Adamson	0.75	82.50	Service in connection with filing Patent	110348-133033	4324891
02/06/2004		Invoice=874739	0.75	82.50	Application, including preparing and filing		
					transmittal package, and post-filing processing		
05/03/2004	HLA	Heather L Adamson	0.10	11.00	Service rendered in connection with reviewing	110348-133033	4420259
06/07/2004		Invoice=885299	0.10	11.00	and processing Filing Receipt		
08/12/2004	HLA	Heather L Adamson	0.10	11.50	Service rendered in connection with reviewing	110348-133033	4508374
09/08/2004		Invoice=893301	0.10	11.50	and processing Notice of Recordation of		
					Assignment		
02/17/2005	HLA	Heather L Adamson	0.25	30.00	Service in connection with reviewing and	110348-133033	4685681
03/09/2005		Invoice=908471	0.25	30.00	processing Office Action, and uploading and		
					updating CPA		
03/02/2005	ATAW	Aloysius T (AI) AuYeung	0.25	100.00	Services in connection with receipt of office	110348-133033	4700360
05/09/2005		Invoice=913918	0.25	100.00	action, including initial review of the same		
04/12/2005	MMC	Mark McClure	4.00	720.00	Review office action; review cited prior art;	110348-133033	4741367
05/09/2005		Invoice=913918	4.00	720.00	review claimed invention; map cited art against		
					claimed invention		
04/13/2005	MMC	Mark McClure	7.50	1,350.00	Review office action; review cited prior art;	110348-133033	4741370
05/09/2005		Invoice=913918	7.50	1,350.00	review claimed invention; map cited art against		
					claimed invention; draft response		
04/13/2005	YLC	Yvette L Chriscaden	1.10	99.00	Prepare base response to office action for	110348-133033	4743114
05/09/2005		Invoice=913918	1.10	99.00	attorney expansion		
04/15/2005	ATA	Aloysius T (AI) AuYeung	0.50	200.00	Reviewed and revised response to office action	110348-133033	4743736
05/09/2005		Invoice=913918	0.50	200.00			



Date	Initials	Name/Invoice Number	Hours	Amount	Description	Matter Number	Index
04/16/2005	MMC	Mark McClure	0.80	144.00	Review and revise response	110348-133033	4741375
05/09/2005		Invoice=913918	0.80	144.00			
04/18/2005	YLC	Yvette L Chriscaden	0.30	27.00	Services in connection with preparation of	110348-133033	4743125
05/09/2005		Invoice=913918	0.30	27.00	response to office action and accompanying		
					documentation for filing		
04/18/2005	ATA	Aloysius T (AJ) AuYeung	0.25	100.00	Services in connection with filing response to	110348-133033	4749106
05/09/2005		Invoice=913918	0.25	100.00	office action		
		BILLED TOTALS: WORK:	57.78	12,319.75	26 records		
		BILLED TOTALS: BILL:	46.78	10,119.75			
		GRAND TOTALS: WORK:	57.78	12,319.75	26 records		
		GRAND TOTALS: BILL:	46.78	10,119.75			